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united states cryptologic history

Operation REGAL:

The Berlin Tunnel (~~S-CCO~~)

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UNITED STATES CRYPTOLOGIC HISTORY

Special Series

Number 4

**Operation Regal:
The Berlin Tunnel (S-000)**



NATIONAL SECURITY AGENCY/CENTRAL SECURITY SERVICE

1988

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Foreword

(U) *Operation REGAL* is another volume in the United States Cryptologic History Special Report Series produced by the NSA History and Publications Division. REGAL was the codename for the Berlin Tunnel, a U.S. intelligence community operation conducted during the mid-1950s which was designed to intercept Soviet and East German communications.

(U) [] began research on this subject in September 1985 while on an internship in the History and Publications Division. Working with NSA archival materials, oral interviews with key individuals, and CIA documents, [] completed her study in late 1986. Concentrating on NSA involvement, she offers a number of interesting observations. She reveals that there was little cooperation initially between NSA and CIA regarding the Berlin Tunnel. Although the U.S. intelligence community at first considered REGAL a great success, the Soviets, thanks to George Blake, certainly knew about the operation early on, but apparently did not inform the East Germans of their discovery. Even the Soviet military may not have known (only the top officials of the KGB), leaving the tapped lines to be accidentally uncovered by the East Germans. It is an intriguing story, well told. And until the KGB opens its archives, precisely what the Soviets knew and when they knew it remain a mystery.

Henry F. Schorreck
NSA Historian

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Operation REGAL

~~(TSC)~~ REGAL was the codename for the Berlin Tunnel, a U.S. intelligence community operation designed to intercept Soviet and East German communications. It involved the construction of an elaborate communications intercept center in a tunnel running beneath West Berlin into East Berlin. The tunnel was operational from 10 May 1955 until 21 April 1956 when the East Germans discovered the operation and closed it down. Despite its short operational period, REGAL was initially considered a great intelligence success by U.S. officials because of the large volume of information intercepted. There was also an initial feeling of accomplishment in carrying out such an elaborate intelligence scheme literally underneath the feet of the Soviet and East German military. Later developments led U.S. intelligence community analysts, however, to question the validity of the intercepted information and its importance relative to the expense undertaken in constructing the tunnel. Considered a major Central Intelligence Agency (CIA) operation by the American press, the National Security Agency (NSA) nevertheless played a vital role in the project. This is a study of NSA's involvement in REGAL.

Prelude

~~(TSC)~~ REGAL's origins lay in a similar operation conducted by the British in Vienna between 1949 and 1951. MI-6 (British Intelligence) bought a house in the Vienna suburb of Schwechat and resurfaced the driveway with reinforced concrete, beneath which they constructed a 70-foot tunnel. This tunnel extended from the house's basement to a pair of cables connecting the Soviet occupation forces quartered in the Imperial Hotel in Vienna with command headquarters in Moscow. In 1951, the British informed the CIA about the Vienna tunnel and offered to share with the United States the gathered intelligence.¹ Codenamed "Operation SILVER," this successful monitoring of Soviet landline communications came at a critical period in the history of Allied communications collection.²

~~(S)~~ Due to the increased use of ultra-high frequency line-of-sight radio communications after World War II, Sigint collection effort was yielding drastically decreasing amounts of intelligence - leaving British and American officials desperate for information on Soviet intentions. Before the introduction of high frequency, shortwave communications, airwaves could be monitored at great distances from the actual source because long, low frequency waves bend around the earth. However, the transmitting of large volumes of communications beyond high frequency presented a problem for the British and American analysts as these waves are basically line-of-sight. Alternate intercept methods therefore had to be devised to fill the collection void.³

(U) Carl Nelson of the CIA's Office of Communications accidentally opened the way to new intercept possibilities when he discovered a way to exploit landline messages. SIGTOT, a Bell System Cipher machine used by the United States in global communications, had been rejected by the U.S. government for secure communications during World War II because of its vulnerability to intercept. To their chagrin, Bell technicians discovered that as SIGTOT electrically encrypted a message, faint "echoes"⁴ of the plain text were transmitted along the wire simultaneously with the enciphered message. Refusing to accept Bell's modifications to its 131-B2 mixer, the Army Signal

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Corps abandoned SIGTOT as a vehicle for wartime encryption, and the machine's peculiarity faded into oblivion until rediscovered by Nelson in 1951.⁵

(U) Nelson suspected that SIGTOT's vulnerability, which enabled him to tap into a cable carrying the enciphered message and read the plain text without deciphering, probably existed in other systems. He set out to prove his hypothesis. His interest in the Soviets' Vienna communications led to the revelation that the British had been tapping Soviet telephone lines for two years, since 1949. The CIA applied the SIGTOT experiment to the SILVER cables, and proved that the Soviet communications system was equally vulnerable. What Nelson termed "transients" or "artifacts"⁶ of the cleartext message enciphered by the Soviets at the Imperial Hotel could be distinguished from the signals monitored in Schwechat. Despite being a close ally, however, the British were not informed of Nelson's discovery.⁷

(TSC) Keenly interested in the intercept possibilities, the CIA hoped to use Nelson's innovation to exploit Soviet landlines in East Berlin. Nelson's findings coincided with the discovery by NSA cryptologist Frank Rowlett of a map of Berlin's buried telephone cables. The captured German World War II document indicated the presence of an empty field in the U.S. zone adjacent to a large German truck line. According to former NSA cryptologist Philip Dibben, Rowlett suggested that a tunnel be built in order to tap the telephone cables, but by the time the project was started, Rowlett had joined the CIA as a Special Assistant to the Director of Central Intelligence.⁸ After five years with CIA, Rowlett returned to NSA in 1958.

Berlin: Challenge and Opportunity

(U) Because of the nature of the pre-World War II communications system, Berlin was the central circuit of East European communications. Any calls originating in Eastern Europe were channeled through Berlin, including all calls to Moscow. Monitoring Berlin's communications would greatly increase the U.S. Soviet-Eastern Europe collection effort. Berlin's telephone and telegraph system resembled a wheel, with two concentric circles spanning East and West Berlin. Switching stations, placed at strategic locations around the circle, directed service to each city sector via lines like the spokes of a wheel. The occupying officials divided the city after the war and disconnected the telephone lines from the terminals. To tap into the East Berlin system the CIA needed to reconnect the lines and monitor the cables.⁹

(S) William King Harvey, CIA Bureau Chief in Berlin, enthusiastically pursued the idea of exploiting Berlin communications. Under Harvey's direction the CIA attempted various tapping methods and by January 1953 had obtained a 15-minute sample of a "prime target circuit."¹⁰ To test the feasibility of a tap, Harvey recruited an East Berlin post office employee who tapped a circuit inside the Lichtenberg switching station and directed it over an unused cable pair to a line terminating in West Berlin's post office, where the CIA had installed monitoring equipment. During the next six months the CIA tapped a total of two hours of conversation on the line.¹¹ The test was a resounding success - the CIA collected plaintext artifacts of the enciphered message - and Harvey set out to initiate a full-scale collection effort.¹²

(U) The CIA realized that Berlin inherently posed more difficulties for the tunnel-builders than had Vienna. The border area was under constant scrutiny from East German guards. Without arousing undue suspicion, construction workers would have to burrow from West Berlin under the heavily guarded border into East Berlin in order to tap the cables.

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~~(S)~~ Never having undertaken such a project, the CIA enlisted British aid in its development, recognizing British expertise in the "highly specialized art of vertical tunneling."¹³ The trick entailed digging through soft soil without collapsing the roof. Harvey negotiated with the British and devised the following divisions of responsibility. The CIA was to "(1) procure a site, erect the necessary structures, and drive a tunnel to a point beneath the target cables; (2) be responsible for the recording of all signals produced at the point where the 'lead-away' tapping cables entered the installation; and (3) process in Washington all of the telegraphic materials received from the project." British intelligence agreed to "(1) drive a vertical shaft from the tunnel's end to the targets; (2) effect the cable taps and deliver a usable signal to the head of the tunnel for recording; and (3) provide for a jointly manned U.S.-U.K. center in London to process the voice recordings from the site."¹⁴ Harvey was to oversee the entire project from his base in Berlin.

Just the Right Spot

~~(S)~~ Before Harvey laid out his final plans for Washington's approval, an appropriate site had to be selected. The tunnel had to originate in either the U.S. or U.K. zones in Berlin, with a path in range of the targeted cables. The farther from the border the cable started, the less East German curiosity would be aroused; however, a longer tunnel would also greatly increase the amount of dirt to be excavated and disposed of. Both the operators and the equipment required fresh air, which also set a limit on the length of the tunnel because of the maximum capabilities of the air pumps. The small CIA REGAL planning team finally decided on a spot originating in the U.S. zone where land could be purchased to build the above-ground compound and from which the tunnel length was feasible. Collateral information on the site was also available, identifying the target cable plan, aerial photographs, and utility lines. Geological maps indicated that the area was predominantly flat, with soft soil but uneven drainage. The permanent water table was deemed to be 32 feet below ground. Because of the importance of isolating the electronic equipment from damp areas, the supposedly low water table would aid the engineers by eliminating requirements for watertight construction.¹⁵

~~(S)~~ Armed with technical data, William Harvey returned to Washington to obtain official approval for REGAL. He briefed CIA Director Allen Dulles, Clandestine Services Chief Frank Wisner, and Deputy Clandestine Services Chief Richard Helms concerning his meetings with the British and the blueprints for the tunnel's construction and operations. Dulles approved Harvey's plans, directing, however, that "in the interest of security as little as possible should be reduced to writing."¹⁶ The U.S. side followed Dulles's stipulation scrupulously, but the British retained extensive notes of the proceedings. Minutes of the initial meeting between Harvey and the British were kept by an MI-6 agent, George Blake.¹⁷ However, CIA officials decided not to inform the rest of the intelligence community of the project, not even NSA.

~~(S)~~ The tunnel operation got underway in 1954 with the construction of a two-story warehouse in West Berlin over the area chosen to be one terminus of the tunnel. Although the construction workers would not comprehend the purpose of a two-story warehouse with a basement requiring a 12-foot ceiling, its large size was required to hold the expected 3,000 tons of dirt excavated from 1,476 foot long, 6½ foot wide tunnel. The main floor housed the electronic equipment.¹⁸

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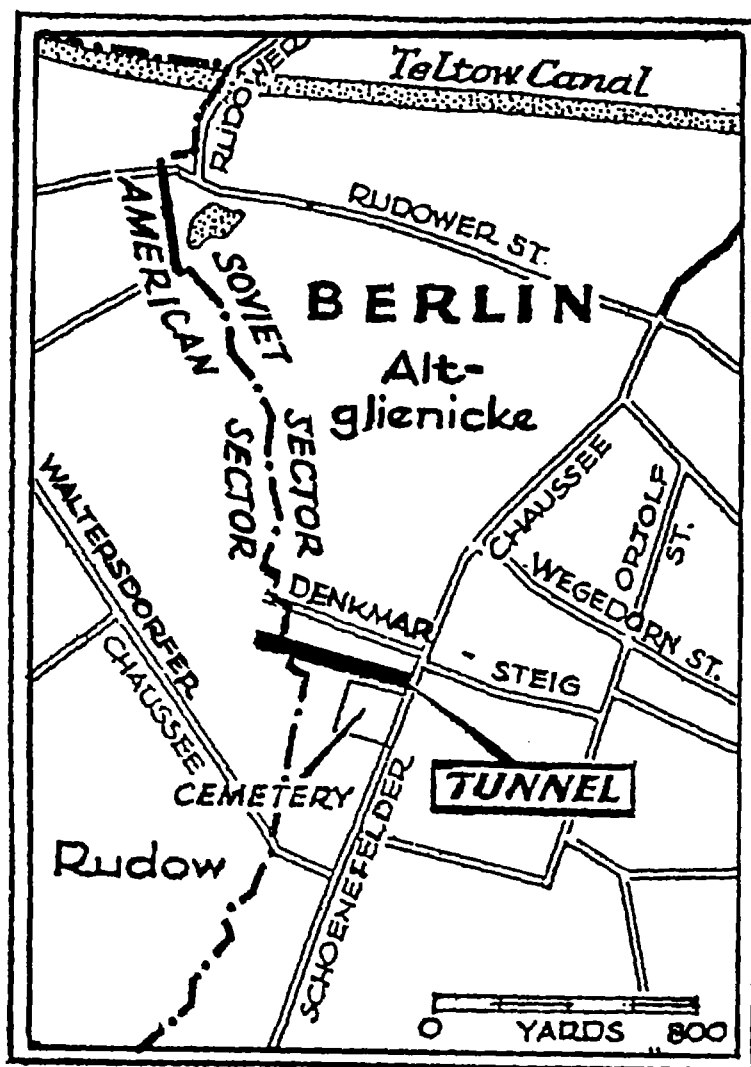
Berlin, the Divided City.

The tunnel lies in the southeast corner of the U.S. sector.

(S) While the warehouse in West Berlin was under construction, simultaneous operations were underway in New Mexico and Richmond, Virginia. Army engineers led by Lieutenant Colonel Leslie M. Gross of the Engineering Corps began building a test tunnel at the White Sands Missile Proving Ground.¹⁹ The New Mexico version was 450 feet long and dug at a depth of 20 feet, with 13½ feet between the roof and ground surface. Meanwhile, equipment for the Berlin job was assembled in Richmond. Among the supplies were 125 tons of steel liner plates which when joined created the tunnel's walls. The plates were specially treated with a protective rubber coat to suppress noise during construction. The gathered supplies then went by ship to Bremerhaven, West Germany, and by train to Berlin and the completed warehouse near Altglienecke.²⁰

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The site in enlargement, detailing the West Berlin suburban area from which the tunnel began.

Masquerade

(U) The East German border guards probably felt they harbored few illusions concerning the U.S. "warehouse." The building was surrounded by two barbed wire fences, powered by a diesel generator, equipped with a large parabolic antenna, and staffed by the U.S. Army Signal Corps. For all intents and purposes the area appeared to be a poorly concealed radar intercept station.

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~~(S)~~ The overall CIA concept for the area called for observer confusion. In devising the engineering plans for the tunnel, the CIA devoted a great deal of thought to an appropriate "cover" for the project. A two-tiered solution was reached. The "warehouse" itself was deemed sufficiently innocuous to hide U.S. intentions during construction. To obfuscate activity during the tunnel's operational period, the CIA decided to cover the site with an Electronic Intelligence (Elint) station. The U.S. intelligence community was increasingly interested in Elint, and the establishment in West Germany of an Elint station seemed perfectly plausible because of the obvious availability of targets. The Elint cover allowed for extra security and tight compartmentation of information, even among U.S. officials, and provided validity for the presence of Signal Corps troops.²¹

(U) Americans and Germans in the western sector were also curious about the area, and their interest was fed by a series of unusual incidents. A civilian engineer originally heading the construction project quit after publicly protesting the need for such an immense basement. Civilians actually constructing the building were required to wear Army Signal Corps uniforms without explanation.²² Speculation was abundant, but little of substance was learned as the few actually cognizant of the intricacies of the operation were not talking.

~~(S)~~ By 17 August 1954, the German contractors had completed their work, and the U.S. had possession of the compound. All supplies, shipped under disguise and strict security, were in Berlin awaiting the start of construction. Simultaneously, a tunnel group at the CIA's Office of Communications designed the "unique equipment" required to process the expected telegraphic material. A great deal of care went into the selection of components for the taps and electrical equipment. All pieces were scrupulously tested for reliability and constructed of the best materials.²³

Digging In

(U) Construction of the tunnel was a laborious, time-consuming task, complicated by surveillance and security risks. Beginning in the basement's easternmost point, the engineers

sank a vertical shaft 18 feet in diameter to a depth of 20 feet, then drove pilings halfway into the floor of the shaft. Next, a steel ring 6½ feet in diameter and fitted with hydraulic jacks around its circumference was lowered into place. Braced against the exposed section of the pilings, the ring, or "shield," was fitted flush against the tunnel's face.²⁴

~~(S)~~ Three-man shifts using picks and shovels worked on the tunnel's construction 24 hours a day. Gains were small: the team excavated two inches, shoved the shield forward, and then repeated the process. After they had excavated an entire foot, the engineers bolted a steel liner plate onto already bolted plates to form the tunnel wall. They lined the tunnel with steel so that the walls would not implode due to the large percentage of sand in the soil.²⁵ The plates each contained small holes which the engineers unplugged and filled with cement to pack any space left between the dirt and the wall. After six feet had been completed, the existing wall was secure enough to brace the jacked-forward shield, and the engineers removed the hydraulic jacks from the process.²⁶

~~(S)~~ The tedious process was slowed because of the security demands placed upon the engineers. A lookout kept watch around the clock to observe any signs of undue suspicion or curiosity on the part of the East Germans. Whenever German guards walked over the work area, the team halted construction. Building plans called for as quiet an operation as steel and hydraulic jacks could allow. The U.S. team finished the tunnel shell on 28

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February 1955, complete with a steel and concrete "anti-personnel" door on the East Berlin side to prevent East German officials from storming the tunnel upon discovery.²⁷

The British Contribution

~~(S)~~ The British then entered the project, constructing the tap chamber between 10 and 28 March. They initiated the complex procedure for reaching the cables, using techniques British engineers had experimented with on a model tunnel in the U.K.²⁸ An operation similar to the original excavation process was undertaken as another shield was used to dig vertically towards the cables. This shield, unlike the one used to line the tunnel, however, had small flaps to prevent an implosion of the ceiling. After the British workers excavated the earth-ceiling, they jacked up the shield vertically, and then repeated the process until they reached the cables.²⁹

~~(S)~~ Located 27 inches below the ground surface, the three targeted cables ran next to the main highway to Schoenfeld Airport.³⁰ The British engineers constructed the shaft up to within 12 inches of the highway surface and pulled the three cables down into the shaft to apply the tap.³¹ The British filled the cables with nitrogen gas and pressurized the area to prevent the gas from escaping since only a small portion of the cables' signal could be "drawn off" in order to keep the East Germans unaware of a loss in signal strength.³² British experts also removed the cables' rubber protective lining and attached wires to color-coded circuits.³³ The intercepted signals were then carried via these wires to amplifiers lining the tunnel walls and returned to the circuit. The amplifiers conveyed the sound signals to tape recorders within the tunnel for actual monitoring. A total of 150 tape recorders preserved the East German and Soviet telephone calls for U.S. and British study. The British tapped the three cables on 11 May, 21 May, and 2 August, respectively, and they immediately began providing information.³⁴

Completion... the Work Begins

~~(S)~~ The finished tunnel was 1,486 feet long, with the first half sloping downward and the second half sloping upward. To keep the equipment and the cables dry, the Army engineers installed pumps on both sides and panelled the section adjoining the tap chamber with "marine-type plywood" for insulation.³⁵

~~(S)~~ While the engineers completed the tunnel, CIA personnel fabricated a contingency plan to be effected upon discovery of the tunnel by the East Germans. The U.S. would publicly deny all knowledge of the tunnel. Secretly, the operatives were to defend against forced entry, activate the anti-personnel door, and if necessary, demolish the tunnel with charges mined at the border.³⁶

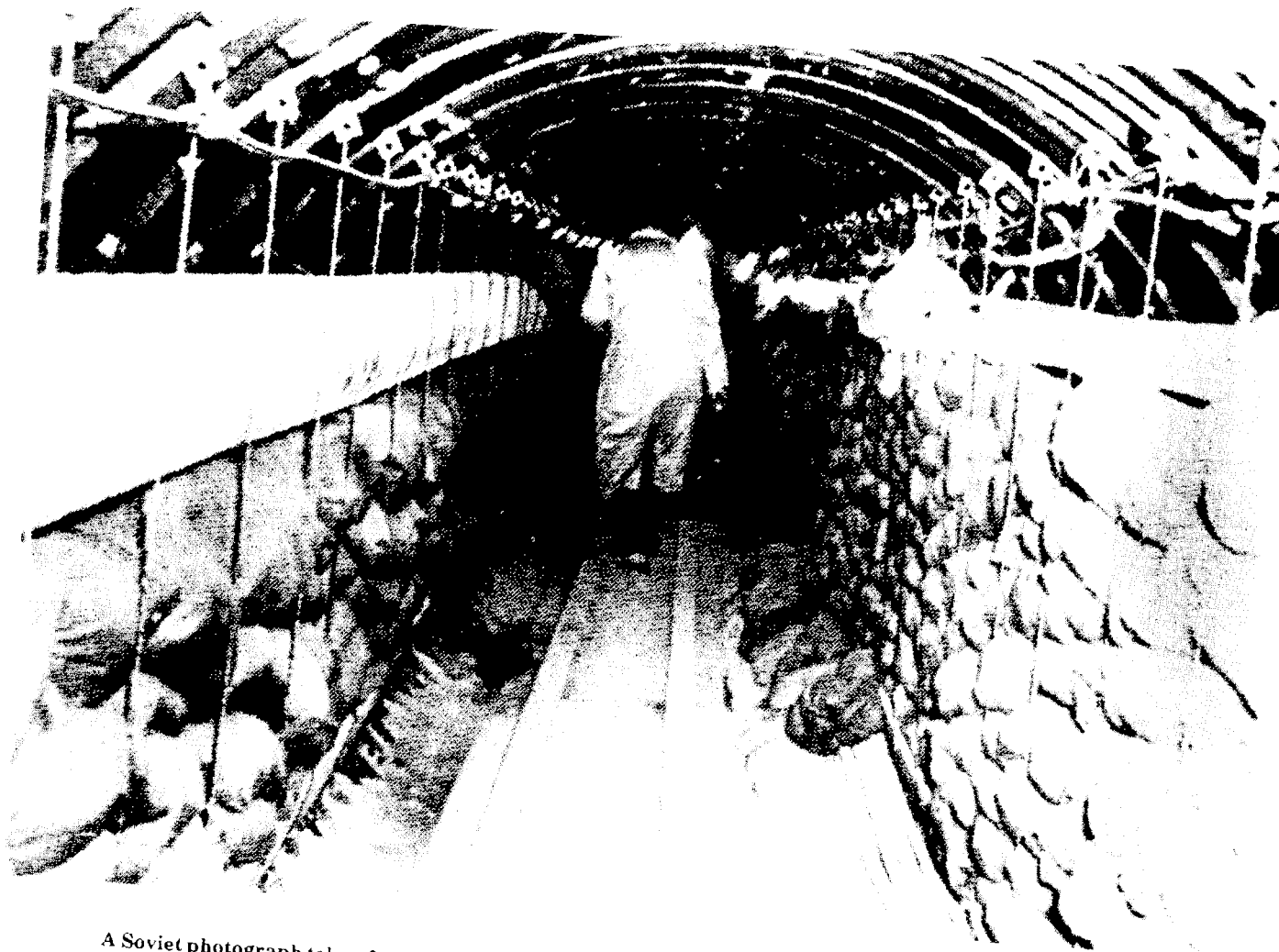
~~(TSC)~~ REGAL became operational on 10 May 1955, and from the beginning collected a vast amount of information. According to Colonel Russell Horton, an Army Security Agency officer stationed in Berlin at the time, the collectors were "turning out that stuff by the car loads."³⁷ Another analyst stated that they "used to haul three or four mailbags back from Berlin" to Frankfurt at a time for initial processing.³⁸ Analysts probably separated the voice and printer material [REDACTED]

[REDACTED] U.S. personnel monitored the tunnel inside and out 24 hours a day.

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A Soviet photograph taken from just beyond the chamber where the landline taps were applied. Intercepted signals were relayed to the U.S. sector through the cables shown at the lower right corner of the passageway.

~~(TSC)~~ The monitoring and processing of the captured telephone calls and teleprinter signals was a complex affair. Although technicians monitored a few circuits at [redacted] Berlin [redacted] security precautions prevented the REGAL managers from maintaining in Berlin the large number of persons required to process most of the traffic. Collectors cabled telephone items requiring immediate attention to the Main Processing Unit (MPU) in London, predecessor to the London Processing Group (LPG). [redacted]

MPU was tasked with processing the voice communications. [redacted] sent printer traffic to Washington to be processed by CIA's Telegraphic Processing Unit (TPU), also called the Washington REGAL Center (WRC). U.S. military transports, heavily guarded by MP's, flew the intercept out of West Germany. An additional CIA REGAL monitoring team perhaps shared a base at [redacted] outside Nuremburg, without informing the NSA and ASA operatives of its purpose.⁴³

Relying on a Rival

~~(S)~~ According to CIA officials interviewed after the termination of the operation, the biggest problem with the tunnel concerned the "quantity and content of the material available from the target and the manner in which it was to be processed."⁴⁴ CIA officials kept strict control over who had access to tunnel information, using the same standards as those for Special Intelligence (SI).⁴⁵ It was especially difficult to find adequately trained linguists cleared for SI to process the traffic. The CIA tested all its personnel with any knowledge of Russian or German for possible assignments as translators,⁴⁶ but CIA resources were strained to the limit. Only then was material given to NSA linguists.

~~(TS-CCO)~~ Although the CIA knew what communications lines were supposed to be in the tunnel area from Frank Rowlett's map and had some information as to the type of communications involved, the tunnel analysts did not know what sort of information would be intercepted. While they perhaps suspected that some of the intelligence would be enciphered, the CIA security regulations devised for the project originally prohibited the involvement of non-CIA analysts. Because no one at CIA could identify the ciphers, however, adjustments had to be made to the control requirements.⁴⁷

~~(TS-CCO)~~ NSA was deliberately not informed of the tunnel operation until at least a month after it became operational due to inherent rivalries between the two agencies and the strict CIA security regulations. At that time, Dr. James R. Nielson, an NSA analyst heading a Soviet processing unit, was called into the office of Brigadier General Woodbury M. Burgess, head of PROD (Office of Production). General Burgess and his assistant, Philip J. Patton, Jr., briefed Nielson on the tunnel operation and asked if he would be willing to be NSA's "processing contact with CIA" in L Building, a World War II temporary building located on the Mall in Washington.⁴⁸

~~(TS-CCO)~~ The initial NSA involvement in REGAL was small and low-level because of CIA concerns. According to CIA interpretation, a wiretap was not classified as signals intelligence and was therefore outside NSA jurisdiction. Frank Rowlett finally recruited NSA operatives because he realized that NSA was the only agency that could do the traffic processing. Although CIA analysts were doing a "credible job" with the translations and even traffic analysis, they were unable to recognize the ciphers and codes, while "NSA had people who knew those things cold." CIA personnel initially put up some resistance to NSA's inclusion in the processing, but Nielson was eventually able to obtain spots for up to a dozen NSA analysts in the L building.⁴⁹

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~~(TS-CCO)~~ CIA and NSA fought over a great deal of the exchanged material. CIA was reluctant to give up its jurisdiction over the intelligence and refused to release certain information to NSA due to CIA rules and regulations concerning compartmentation of information. NSA, on the other hand, wanted to know everything concerning the CIA operation. Nielson recalled that when he would report back to NSA, General Burgess and Phil Patton would debrief him on everything he saw at CIA to ensure that NSA received all REGAL reports. Two former NSA analysts, [redacted] [redacted] headed the CIA L Building operation, and these two "smooth numbers" were often "slow to give" up REGAL intelligence. NSA officials were especially annoyed that CIA was holding back duplicates of traffic, since clear landline text could help confirm intelligence taken imperfectly off the air.⁵⁰ It was a touchy situation.

~~(TS-CCO)~~ Both CIA and NSA relied heavily on Carl Nelson's communications discovery to process the telegraph messages. The analysts received huge quantities of teleprinter tape and printed sheets of Morse daily.⁵¹ They then decoded the signals and removed the plaintext elements. The CIA temporary building where the work was done was a precursor to today's "tempested" buildings, "sheathed in steel"⁵² to ensure that the decoded signals did not return to the atmosphere for foreign collection.

~~(TSG)~~ NSA did not become involved in REGAL on a large scale until after the tunnel's discovery in April 1956, when the CIA realized that the source was no longer so sensitive. At first, CIA limited NSA to cipher traffic, but by the summer of 1956 it forwarded copies of virtually all [redacted] material – voice transcripts, teleprinter traffic, and published reports – to NSA for analysis.⁵³ Although most of the REGAL material was plain text, NSA received cipher material, mostly one time pad, in patterns such as mononome-dinome substitution.⁵⁴ According to Nielson, the CIA moved the center of the U.S. REGAL effort to NSA after the tunnel's discovery because of the large cryptanalytic and traffic analytic effort, and divided processing of the information between elements at Fort George G. Meade and Arlington Hall Station (AHS). NSA's GENS (General Soviet)⁵⁵ organization coordinated the effort.⁵⁶

~~(TS-CCO)~~ REGAL became a monumental operation for NSA. General Burgess decreed that specific organizations donate a certain number of personnel to the REGAL effort. Linguists, analysts, administrative and clerical personnel worked together in a comprehensive effort to organize the material so that it could be worked and processed logically. Nielson believed that there was a political angle to NSA's large-scale operation. CIA was one of the largest consumers of REGAL information, and NSA felt it had to "show them up" by demonstrating that its analysts were capable of doing what CIA analysts were not.⁵⁷ "REGAL was quite a big dog fight . . . between agencies at that time."⁵⁸ Jane E. Dunn, a cryptanalyst assigned to GENS-5 at Arlington Hall Station who worked the REGAL material from the beginning, reemphasized the agency competition: NSA "stoutly maintained" that it should process all cipher material, while CIA, as the collector, argued, "You give us the expertise and we'll read it." At one point, Dunn's supervisor told her that CIA wanted NSA to break the cipher traffic without reading any of the material.⁵⁹

Intelligence Production

~~(TSC)~~ After NSA and CIA analysts worked the traffic and identified the plain text, they divided the messages between several translation centers manned by Russian and German linguists. Between May 1955 and April 1956, NSA issued 11,863 translations on 8" x 13" sheets, while CIA issued 11,750 translations on 5" by 8" cards. Although the initial NSA focus in REGAL processing was on the problem of cryptanalysis, applying all

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traffic analytic or linguistic capabilities as support for the cryptanalytic effort,⁶⁰ NSA soon began to pull more and more of its linguists, especially those at Arlington Hall, into the REGAL problem.

~~(TSC)~~ On 6 June 1955 the Washington REGAL Center (WRC) issued the first intelligence report based on the extensive teleprinter translations. The WRC aperiodic reports were classified "TOP SECRET REGAL" and occasionally contained the codeword "EIDER." The Main Processing Unit in London issued aperiodic intelligence reports under the title JMTRS, which expanded to Joint Military Translation and Reporting Service.

~~(TSC)~~ The intelligence reports issued by the WRC and the JMTRS usually contained several unrelated items in a format similar to a weekly activity summary. Previously reported items were often referenced as new information became available. Major topics of interest were East German security, such as the names of persons traveling outside the German Democratic Republic (GDR); the investigation of foreign agents; and surveillance of Western military and intelligence personnel and operations. Intercepted messages revealed that the Soviets were particularly interested in U.S. helium balloons.⁶¹ Statistics on the numbers of persons illegally fleeing East German were also reported, as were antiregime opinions held by various sectors of the population.

~~(TSC)~~ The REGAL reports were a great source of relatively straightforward order of battle information. Details on the day-to-day governing of the military forces in Germany disclosed by the intercepted telephone calls and teleprinter traffic enabled the U.S. intelligence community to identify new Soviet air units such as the one at Stettin (Szczecin), which was subordinate to the 37th Air Army headquartered at Liegnitz; upcoming anti-aircraft artillery exercises; the arrival of new aircraft at various units; and on-going airfield construction. Also of background interest was information concerning Soviet and East German military officials and training activities. The U.S. learned, for example, that East German Air Force officers received training at the Soviet Air Academy in Monino, while noncommissioned servicemen trained in technical operations and radio communications at a Moscow Air Academy, and that the Soviets had introduced the East Germans to the

Some Interesting Sidelights

~~(TSC)~~ In addition to information that helped guide intelligence analysts to a better understanding of Soviet and East German capabilities, such as order of battle, training facilities, and equipment, the U.S. intelligence community observed the factions and infighting that existed between the Soviets and East Germans. Political and psychological problems hindered the Soviet training process. Morale was a major problem, and Soviet officers devoted several meetings and phone conversations to the poor esprit de corps and the increasing number of East German political defections. Soviet officials complained vociferously about the "slowness and incompetence of the East Germans in completing the staff work necessary for implementation of the establishment of the National Army."⁶²

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Intercept also reflected that confusion existed within Soviet ranks concerning the new Party line, as well as the revised Soviet history following the death of Stalin and the consolidation of power under Nikita S. Khrushchev. The Soviets and East Germans could not agree upon which organizations were ultimately responsible for border control incidents. Both military and diplomatic personnel believed that they should handle all incidents involving the citizens of the other three occupying powers. These insights from intercepted information provided valuable background information, but little of a strategic or scientific nature was discussed over the lines.

Strategy

~~(TS-CCQ)~~ The CIA was apparently satisfied, to a certain extent, with this non-strategic intelligence. A major U.S. objective in monitoring Soviet communications was to gain foreknowledge of a Soviet attack on West Berlin or Western Europe. Although the scenario never materialized, the Berlin taps did give the U.S. military and intelligence community a temporary feeling of security in a city dominated and divided by two opposing ideologies. Access to Berlin was still somewhat of a concern to U.S. officials, but as long as NSA and CIA were privy to the same routine messages every day through REGAL intercept, the situation appeared to be "normal."⁶³

~~(TSC)~~ The WRC played the leading role in the early REGAL effort because it was responsible for most of the political reports and translation syntheses. NSA, however, gradually began to take a larger part in the processing and reporting operation. NSA linguists translated a great deal of REGAL Russian and German intercept, and NSA analysts produced from REGAL traffic analytic and cryptanalytic studies as intelligence support.

~~(TSC)~~ As the volume of [] traffic arriving at NSA grew, NSA officials established a central REGAL office to deal with the information. In July 1956, GENS-143 (later GENS-443), as the center of the overall REGAL effort, undertook "(1) to receive, classify and distribute the traffic and maintain a master file thereof; (2) provide translation services and produce digests of Russian telegraphic transmissions; and (3) promote traffic analytic support to NSA elements on the Russian intercept."⁶⁴ Dr. Nielson was named Chief, GENS-14.

~~(TSC)~~ Although GENS-143 (443) was technically the center of the NSA REGAL effort, the NSA production divisions were ultimately responsible for exploiting any information found in [] material.⁶⁵ Therefore, many NSA elements aided the operation. For example, GENS-5 handled East German REGAL traffic, and GENS-14, ADVA (advanced Soviet)-12, and GENS-6 did the joint processing at AHS of the channels containing the bulk of Russian cipher material. NSA cryptanalysts worked on the third floor of one of the Fort Meade barracks while the Operations Building was under construction.⁶⁶ This division of responsibility between Fort Meade and AHS led to some lack of communication. Between 1955 and 1957, the entire agency gradually moved from AHS to Fort Meade, and as communication channels were not as advanced as they are today, confusion often prevailed as information was literally manually hauled back and forth between the two complexes.⁶⁷ By August 1956, Fort Meade handled scan sheet translations of Group of Soviet Forces, Germany (GSFG) and Soviet Naval Forces traffic, and was ultimately responsible for traffic analysis (TA) checking and the distribution of scan sheets. GENS-14(W) at AHS worked on traffic from the Soviet Ministry of Internal Affairs (MVD) and scrambler.

~~(TSC-REL TO UK)~~ Fort Meade's technical TA operations focused on several targets. Analysts continually compiled REGAL covernames, four-digit Soviet correspondent

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numbers (KORR), station serial numbers (NR's), callsigns, military unit numbers (MUN's), and appointment numbers. The TA offices also reviewed before publication the scan sheets prepared by the linguists, and briefed related divisions on the REGAL TA effort.

~~(TSC REL TO UK)~~ Throughout the period that NSA was involved in the REGAL effort, GENS-1 (4) kept statistics on the amount of traffic worked, the personnel involved, and the total and average number of person-hours per week into which it equated. Traffic was recorded in units of channel per day, with one channel day represented as a continuous piece of hard copy containing the traffic transmitted in one direction on one channel of one circuit for a 24-hour period.⁶⁸ In August 1956, GENS-14 supplied the following statistics:

TRAFFIC PROCESSING (CUMULATIVE TOTALS)

1. German REGAL traffic received for processing by GENS-5:

Estimated total available	26,541 channel days
Received to date	2,783 (10.4%)

2. Russian REGAL traffic received and processed:

Estimated total available	20,824
Received to date	3,253 (15.6%)
Read and digested	483
Checked (language and TA)	187
Completed and distributed	177
Clipped and forwarded to PROD	1,875 ⁶⁹

~~(TSC REL TO UK)~~ The number of persons working on the project increased as NSA attempted to quicken the processing pace. In July 1956, GENS-14 gave the following personnel statistics:

PERSONNEL STRENGTH	PERMANENT	TEMPORARY	REQUIRED
Administrative/staff	4		5
Unit I - Traffic	7	3	20
Unit II - Control	6	2	25
Unit III - Support	3		10
Totals	20	5	60 ⁷⁰

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~~(TSC REL TO UK)~~ By December 1956 the personnel involved with REGAL had increased greatly:

**ACTUAL FULL- AND PART-TIME PERSONNEL INVOLVED
IN GENS-143 REGAL OPERATION**

GENS-14 and GENS-143	39
GENS-14(W)	33
GENS-6 (Language - 20)	
(Traffic - 2)	22
ADVA - 1 (Language)	5
ADVA - 2 (Language)	1
Overtime typing pool	13
Total	113 ⁷¹

~~(TSC REL TO UK)~~ Because the REGAL effort involved so many divisions and organizations within NSA, GENS-14 established a "REGAL Panel" made up of representatives from GENS-1, 2, 3, 4, and 6, and ADVA. The panel was to do "the preliminary evaluation and assignment of responsibility for processing of REGAL material."⁷² By October 1956, the REGAL Panel had met several times, and GENS-14 considered its work extremely helpful in expediting the production of scan sheets, informing the various REGAL divisions of CIA and GCHQ REGAL efforts, and for providing an opportunity for "free discussion of the many and various needs and problems of the Divisions using REGAL material."⁷³ In a more extensive statement, GENS-143 elaborated on the panel's purpose as being

to make the work of the REGAL Group, GENS-143, as responsive as possible to the work of the processing Divisions and to insure that there will be as little duplication as possible of work on REGAL material utilized by the various Divisions in end-product reporting.⁷⁴

~~(TSC REL TO UK)~~ In short, the REGAL Panel provided better communication channels between NSA REGAL elements. However, NSA also required information on the REGAL efforts at CIA and GCHQ so that efforts were not duplicated at the separate centers and the intelligence shared. NSA was responsible for maintaining normal relations with TPU, and assigned representatives of various NSA elements as liaison to CIA, replacing Dr. Nielson. Initially, just ADVA-1 had worked with scrambler tapes at TPU, but as the effort progressed, representatives from GENS-143, GENS-6, and ADVA-1 worked part-time in Washington.⁷⁵ In December 1956, GENS-3 undertook a scanning project at TPU, reviewing [] traffic not already processed in order to expedite delivery to NSA of potential information on the 1 November 1955 Soviet call sign change.⁷⁶ Relations with CIA continued to improve due mainly to the supply by NSA to TPU of additional intercept processing equipment.⁷⁷ In addition to improved NSA-CIA joint efforts on REGAL, NSA's communications with GCHQ increased in September 1956 when NSA began receiving MPU REGAL voice transcripts. Initially, the only contact NSA had with GCHQ on REGAL efforts were the informal conferences between James Nielson and GCHQ liaison to TPU []. According to Nielson, the two used to "commiserate" over their "mistreatment" by CIA.⁷⁸

~~(TSC REL TO UK)~~ NSA's involvement in the processing of [] material increased as officials at CIA and GCHQ came to recognize that NSA's cryptanalytic and traffic analytic skills were essential to the eventual completion of the project. NSA's

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REGAL elements expanded to cover the increasing work and responsibility, filtering the work down to many analysts. High-level interest was indicated by the presence of Deputy Director Dr. Howard T. Engstrom at REGAL project meetings. In January 1957 GENS-143 took over from GENS-12 the responsibility for collection and research of [] MUN's. On 4 January 1957 former GENS-14 Chief and NSA liaison to CIA James Nielson transferred to ADVA-05, where he did end-product reporting for a high-grade machine cipher cryptanalytic organization peripherally involved with REGAL.⁷⁹ Because of the amount of traffic, GENS-6 transferred additional Russian linguists to GENS-14(W) at AHS for the duration of the project.⁸⁰ Persons within GENS and ADVA were pulled into the project when a specific need arose, such as additional outside tasking on a particular topic. They then returned to other duties as REGAL material became less urgent. GENS-14 kept monthly records of the elements and personnel aiding the effort.

~~(TSC-REL TO UK)~~ By March 1957, GENS-14 also prepared REGAL documents for distribution within the intelligence community. The product, which included translations, summaries, and working aids, was sent to a standard distribution for the Soviet problem, which included CIA, the Department of State and field stations that intercepted Soviet communications.⁸¹ In addition, GENS-143 worked with staff and division officials to prepare an NSA circular governing the use of [] material and provided REGAL information to field units in the form of Technical Support Letters (TSL). Some TPU and MPU intelligence reports and working aids were also made available to selected field sites.⁸² On 1 April 1957, GENS-14 published the first NSA working aid, based entirely on [] information, which concerned the allocation of five-figure MUN's to a specific armed service by the initial three digits of a given MUN.⁸³ Other NSA REGAL reports included Signal Identification Reports (SIR) on the telegraphic addresses (TELADS) in []

[]

[] Clearly, NSA was taking over most of the work load for project REGAL.

~~(TSC)~~ In March 1957, GENS-443 published a summary of NSA's REGAL processing. Included in the report was a net diagram of the recovered communications links. [] monitored just three landline cables in Berlin, but the communications traffic passed on these lines encompassed a much greater area. GENS-443 obtained considerable information on the landline systems throughout East Germany, much of Poland, and to a certain extent, within the USSR. It also reviewed information on landline circuit and wire numbering systems, locations and functions of control test points (KIP's), landline routes, methods of communications operations, types and uses of communications equipment, and the responsibility for control and maintenance of lines.

[]

~~(TSC-REL TO UK)~~ Although CIA, NSA, and GCHQ attempted to maintain liaison efforts, communication channels were often unintelligible and unclear. For example, one question never adequately clarified for NSA was the connotation of the word "REGAL." According to NSA, the coverterm had been intended as a source designator for the Berlin

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Tunnel and [] not as a codeword classifying anything having to do with the subject. However, MPU and TPU reports received by NSA were marked with the classification "TOP SECRET REGAL." A query to TPU on the subject led to MPU-TPU discussions concerning the coverterm, but if an agreement was reached, it was not uniformly applied.⁸⁵ NSA reported in April 1957 that REGAL reports were still being classified in four different ways, depending upon the author agency and the material contained within. MPU and TPU classified product based only on [] material which revealed the source as "TOP SECRET REGAL." Reports based only on [] material but containing the MPU-TPU phrase "From a clandestine source of established authenticity," or TPU phrase "From a clandestine technical source of established authenticity," were classified "TOP SECRET." REGAL product fused with EIDER information was marked "TOP SECRET EIDER REGAL," and NSA and GCHQ stamped reports based wholly or in part on [] information as "TOP SECRET EIDER."⁸⁶ It was a bit confusing.

(TSC) As NSA's REGAL operation reached approximately its midway point in 1957, increasingly high priority was given to processing the channels pertaining to possible latent Soviet atomic energy information, with which the Eisenhower administration and CIA were very concerned. []

[] intelligence reports even noted Soviet interest in Western films concerning atomic energy and the called-for destruction of the then-current Soviet atomic energy handbook.⁸⁸ REGAL information eventually identified several hundred people associated with the Soviet atomic energy program, areas within the Soviet Union associated with atomic energy activities, and the mining of uranium in parts of East Germany.⁸⁹

(TSC) NSA's involvement in other current and time-sensitive projects led to a decreased emphasis on REGAL towards the end of 1957, as the intercepted material became more and more outdated. NSA asked TPU for an IBM run of Russian REGAL material concerning personal citations in Berlin, Zone 9, traffic in order to support NSA processing of a new Soviet multichannel system called [] GENS-51 requested that TPU provide personal citations in German REGAL traffic as a basis for an NSA personality file. By September 1957, NSA was finding it difficult to adequately work the REGAL problem due to the loss of linguists to [] as well as "general attrition."⁹⁰

(TSC) By November 1957, the tunnel had been closed for over 18 months, and NSA PROD officials tentatively approved a reduction and modification of the REGAL effort. Once the material was no longer current, it was rather rapidly phased out.⁹¹ Following PROD's directive, GENS-44 took action: it sent a cable to GCHQ detailing the planned reduction of the effort; it sent justifications and explanations in a memorandum for the record for all scan sheet recipients; and it implemented a policy of "selective screening" of REGAL material by NSA analysts in place of full translations.⁹² CIA informed NSA the following month that the WRC-TPU office would be deactivated on 31 December 1957, when most of the REGAL material would have been worked. MPU at the London REGAL center continued its operations until 30 September 1958 to complete the voice transcription effort.⁹³ Between the deactivation dates of the WRC and MPU, a small REGAL unit was maintained in the temporary building on the Mall in order to provide contacts for GCHQ in the event of questions or problems, complete IBM processing of REGAL data, and follow-through on any consumer requirements such as information on order of battle or East German and Soviet military individuals.⁹⁴

(TSC) According to TPU, as of December 1957 all Russian and German telegraphic material from [] was page-printed, resulting in a total of 20,578 channel days of Russian traffic, and 20,130 channel days of German traffic.⁹⁵ The WRC published two

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working aids at that time, one listing Soviet General Officers, and the other Soviet MUN's observed in [] material.⁹⁶ NSA also continued to issue REGAL publications, distributing in April 1958 reports developed from a fusion of [] material with other Comint detailing Soviet Ministry of Defense station serial numbers and callsign changes.⁹⁷ As of 13 June 1958, NSA and TPU had scanned 75.4% of [] Russian printer traffic. GENS-44 ceased REGAL scanning operations on 27 June 1958 and terminated traffic analytic studies on 25 June 1958. NSA then officially closed its REGAL effort.⁹⁸

~~(TS-CCO)~~ As stated earlier, most of NSA's involvement in the tunnel operation occurred after the tunnel was discovered. Only James Nielson and a handful of other high-level NSA analysts were aware of the existence of the covert CIA operation until it was exposed. Although the CIA realized that the tunnel would be discovered eventually and the collection operation shutdown, no one could have foreseen the circumstances that led to its disclosure.

Discovery

~~(TS-CCO)~~ On 21 April 1956, eleven months and eleven days after the U.S. first began monitoring Soviet and East German communications, an East German repair crew uncovered the tapped cables. Dr. Nielson recalled going to work one morning and being told "It's all over."⁹⁹ Several days of heavy rainfall had flooded the low-lying areas, and while the pumps on the U.S. side of the tunnel were powerful enough to keep the electrical equipment dry, the pumps on the East German side were not strong enough to do so, resulting in an electrical short.¹⁰⁰ Between 17 and 22 April, all of the cables were inoperable at some point.¹⁰¹

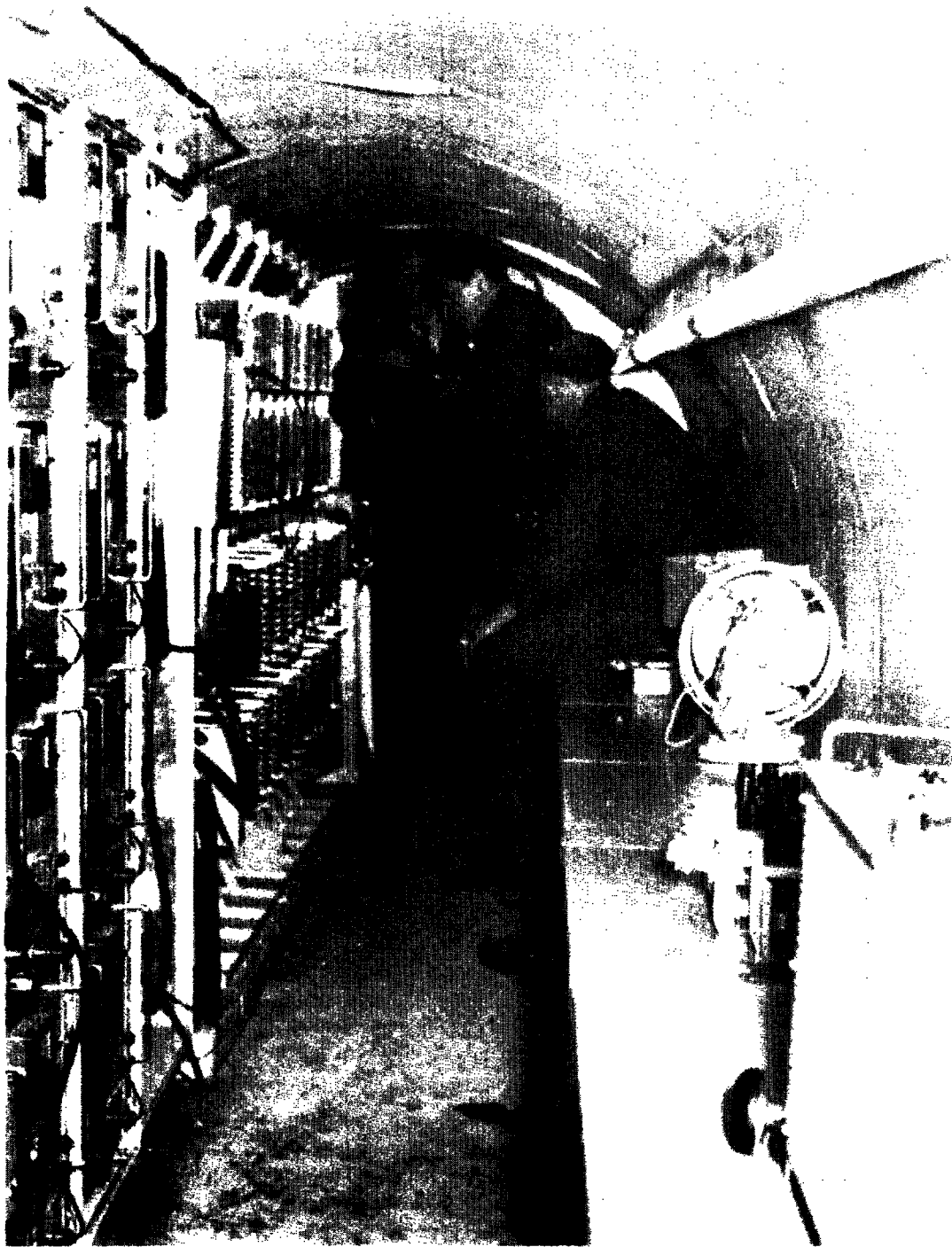
~~(S)~~ On 22 April, the telephone lines for Marshal Andrei Antonovich Grechko, Commander, GFSG, and four of his generals, failed. A fault on cable FK150 eliminated all communications between Moscow and East Germany. Communications for the Soviet Air Warning Control Center also went down and Soviet Signal Troops and East German Post and Telegraph technicians were under enormous pressure to repair the damage. While digging to reach the cable on 22 April, the technicians uncovered the tap chamber at about 0200 hours. The tap chamber microphone at that time picked up the conversation and activity going on around it. Unaware of the significance of their discovery, the technicians continued to dig, finally leaving the site at 0330 to report their findings. It was not until 0630 that the microphone picked up the announcement that "the cable is tapped." Soon afterwards, the East German telephone operators refused to place any outgoing telephone calls, saying that it was against "orders."¹⁰² The intercept operators realized that the end was imminent.

A Tunnel Opens to Mixed Reviews

~~(S)~~ The entire chamber was uncovered and entered around 1300, when pictures and measurements were taken. The East Germans expressed "wonder and admiration" at the technology and ingenuity involved. The last interesting phone calls were placed in the 0800 hour, and the teletype traffic stopped at 1530 when the tap wires were cut. The

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A close-up view of the tunnel's receiver bays and watertight casing. The sandbags along the sides provided sound proofing and insulation.

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microphone was dismantled at 1550, and REGAL could no longer intercept intelligence.¹⁰³ The monitors immediately halted operations and prepared for the backlash.

~~(PS)~~ The Soviet reaction was totally unexpected. U.S. intelligence experts assumed that the Soviet Union would not advertise the fact that its communications had been so totally compromised.¹⁰⁴ However, the commandant of the Soviet Berlin Garrison, Major General Iosif Leontovich Zarenko, was away from Berlin at the time, and the Acting Commandant, Colonel Ivan A. Kotsyuba, decided to expose U.S. "perfidy and treachery" to world opinion. On 23 April Kotsyuba called a press conference to elucidate on U.S. spy activity. Expressing "righteous indignation,"¹⁰⁵ the Soviets apparently hoped to exploit the situation to their advantage and curtail Allied activities to Berlin.¹⁰⁶ With the U.S. "warehouse" looming as the obvious endpoint of the tunnel, the Soviets accused the U.S. of tapping "important underground long-distance telephone" lines linking Berlin with other nations.¹⁰⁷ They conducted official tours of the tunnel and allowed Western press members to cross underground into West Berlin. Exploitation of this "illegal and intolerable action"¹⁰⁸ led to carnival-like enterprise on the East Berlin side, complete with snack bar, as about 90,000 East Berlin citizens toured "the capitalist warmongers' expensive subterranean listening post."¹⁰⁹

~~(C)~~ The U.S. and West German reactions to the accusation and notoriety were subdued and guarded. The U.S. Army denied knowledge of the tunnel but promised to undertake an immediate investigation.¹¹⁰ Little doubt existed among the press that it was a joint U.S.-British operation – the electrical equipment found in the tunnel was stamped "Made in England," while the tunnel pumps were determined to be of U.S. manufacture.¹¹¹ However, the operation amused and delighted the general public in the West. Even Soviet technicians expressed admiration for a tap chamber that resembled the "communications center of a battleship,"¹¹² and American journalists considered ingenious its construction literally underneath the feet of the Soviet and East German militaries.¹¹³ The Western press considered it quite an intelligence coup.

(U) The Soviet propaganda effort, undertaken in satellite countries as well as the West following the tunnel's discovery,¹¹⁴ appeared to backfire, giving the U.S. and the CIA very favorable publicity. Even the later East German claim that the tunnel idea had been originated by Eleanor Dulles, sister of the Secretary of State and at the time Special Assistant to the Director of the Department of State's Office of German Affairs,¹¹⁵ failed to elicit sympathy. The press and the general public assumed that Soviet and East German communications had been compromised for almost a year without detection.

~~(S-CCO)~~ Although the uncovering of the tunnel had come about sooner than expected by Western intelligence officials, they considered the East German discovery "purely fortuitous"¹¹⁶ and the unpredictable result of poor weather and bad luck. The failed cable had been known to be in poor condition, and the British had therefore delayed activating the tap until 2 August 1955, more than two months later than the other two taps.¹¹⁷ However, conflicting opinions soon began to emerge as to the reasons behind the premature demise of [] Privately some U.S. officials believed that only a senior official could have betrayed the REGAL operation at such an early time. Frank Rowlett felt that the Soviets "very clumsily put on an act of discovery."¹¹⁸ However, no hard evidence was obtained until the 1961 revelation of the Soviet spy activities of MI-6 agent George Blake, the very official who had taken such careful notes in the British-American discussions concerning the tunnel.

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**George Blake, a Soviet double agent within British Intelligence (MI-6),
had intimate knowledge of Operation REGAL.**

Mole in the Tunnel?

(U) Born the son of an Egyptian Jew in Rotterdam, George Blake escaped from the Netherlands to Spain on a forged passport during World War II. From Spain he went to Britain where he joined the British Navy and served heroically with Naval Intelligence during the war. Initially recruited by the British Secret Service in 1944, Blake studied Russian at Cambridge in 1947 and was appointed a Vice-Consul with the British Foreign Service the following year. Assigned to Seoul in 1948, Blake, along with the other British Embassy officials, was captured by North Korean Communists in 1950. It may have been during his three years of incarceration that Blake's political opinions were influenced to such an extent that he volunteered to work for the Soviets. Released in April 1953, Blake rejoined British intelligence as an MI-6 secret agent in 1954.¹¹⁹ The fact that his cousin Henri Curiel was one of the founding members of the Egyptian Communist Party was

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apparently not taken into account in his appointment. When arrested in 1961 after being unmasked by a Polish defector, Blake pled guilty to the espionage charges, saying that since 1953 he had given every important document with which he came in contact to his Soviet contact.¹²⁰ Charged with "communicating information that might be directly or indirectly useful to an enemy power"¹²¹ and three violations of the Official Secrets Act,¹²² Blake was sentenced to the maximum 42 years in prison because of his determination "to wreak maximum vengeance" on Britain and its allies.¹²³

~~(TS-CCO)~~ Officially, the U.S. reacted rather calmly to the news of Blake's spy activities. The Department of State held a press conference to state that Blake had apparently not compromised any U.S. secrets.¹²⁴ Unofficially, however, there was a great deal of consternation among the officials involved with the tunnel operation. Frank Rowlett remembered Blake's presence at a U.S.-British meeting on tunnel details in Britain in 1951 and believed that Blake "was well aware of what we were doing" and must have passed the information on to the Soviets.¹²⁵ Carl Nelson of the CIA's Office of Communications said that Blake "knew every detail" of the tunnel operation.¹²⁶ In retrospect, the CIA realized that Blake had apparently also previously compromised the U.K.'s Operation SILVER, the Vienna Tunnel. That tunnel had operated undetected for three years, but almost immediately following Blake's assignment to the listening unit in Schwechat, the Soviets lodged a complaint with the Austrian government concerning a line problem, and the British removed the tap.¹²⁷ American intelligence now had to speculate that perhaps the Soviets had allowed REGAL to operate for almost a year¹²⁸ in order to protect their valuable source in British intelligence.¹²⁹

~~(TSC)~~ Despite its probable exposure by Blake, REGAL produced enormous amounts of information, all of which was examined and analyzed for its intelligence value. Final processing of the material was not completed for almost two and a half years following the uncovering of the operation, despite large-scale efforts by NSA, CIA, and GCHQ. The importance of the material relative to the time and money expended on the project is a crucial underlying factor in an analysis of the operation, and final opinions on the actual value of [] information are mixed. According to Philip Dibben, an NSA cryptanalyst, REGAL was a "pure intelligence operation," illuminating little of value for NSA's cryptanalytic effort.¹³⁰ Allen Dulles, former Director of Central Intelligence, called the tunnel "one of the most valuable and daring projects ever undertaken."¹³¹ NSA's James Nielson considered it "one of the most glamorous, glorious operations of the undercover side of CIA," providing the clearest and best intelligence for the Berlin area.¹³² Still others felt that while the quantity of information obtained from [] was enormous, much of it was of mere "marginal utility,"¹³³ and probably could have been obtained from other sources.¹³⁴ However, while NSA was not able to use a great deal of REGAL intelligence, some of the information did help NSA maintain continuity on routine Soviet activities.

Summing Up: Reassurance...

~~(TSC)~~ A 1957 NSA summary report on [] intercept listed seven order of battle-type items obtained from REGAL material that proved to be very useful in either validating existing information concerning Soviet logistics and capabilities, or of providing totally new theories. These items included the following: the early 1956 consolidation of the 4th and 8th Soviet fleets in the Baltic area into a single fleet - the Red Banner Baltic Fleet, Baltijsk; identification of the 37th Air Army as the true designation for the Air Army in Poland (1948 information had indicated that it was the 4th); confirmation of the 24th as the true unit designator of the Air Army in Germany;

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relocation of the 24th Air Army from the Potsdam-Werder area to the Wuensdorf area in April 1956; the appearance of "OO, KGB," designating a KGB Special Department, in a preamble of a naval message from KORR 850 at Baltijsk; the continued existence and confirmation of headquarters locations of military districts within the Soviet Union; and documentation of current and more exact information on unit commanders and the composition of military units.¹³⁵

~~(TSC)~~ These items were of particular interest to NSA technical elements involved in tracking Soviet military forces, but CIA, as the largest consumer of NSA REGAL product, also benefited from NSA analyses. Although Soviet communications equipment was not then as sophisticated as the types in use today, neither were U.S. intercept facilities, so all information obtained on the capabilities of Soviet forces was a boon for both the U.S. intelligence community and its military commands. The Soviet Union made changes regularly – and seemingly arbitrarily – to its military districts and order of battle, making it very difficult, for example, to track an air army over an extended period of time. REGAL information proved to be of enormous value in aiding this process.

~~(S)~~ While NSA concentrated on specific, technical information gained from [] intercept, REGAL satisfied other objectives for the CIA. The CIA called REGAL a "unique source of current intelligence of a kind and quality which had not been available since 1948," and the primary source on Soviet intentions in Europe.¹³⁶ In the political sphere, REGAL informed the U.S. and U.K. of Soviet designs for Berlin and the "true story" behind officially reported activity. [] intercept also established that the Soviets were determined to maintain their sphere of influence vis-a-vis the other occupying powers in Berlin, despite East German attempts at sovereignty.¹³⁷

~~(S)~~ REGAL intercept allowed the United States to notify its representatives at the 1955 Foreign Ministers Conference in Geneva that the Soviets had decided to establish an East German Army, and the REGAL account of the attempted implementation of the Soviet 20th Party Congress decisions indicated that dissent among Soviet nuclear scientists, aroused by the denunciation of Stalin and the era of collective leadership, was being suppressed. The intercept also followed Marshal Georgiy Konstantonovich Zhukov's downfall as he attempted to decrease the power of Soviet Armed Forces political officers.¹³⁸ It illustrated the often tense military and political relationships within the Soviet party and government and noted conflicts between the Soviet military in Poland and the Poles themselves. Especially important to the CIA effort was the identification of several hundred Soviet intelligence agents operating in the Soviet Union and East Germany, and the organization, functions, and procedures of the KGB and GRU (Soviet Military Intelligence) in East Germany.¹³⁹

... And Misgivings

~~(TSC)~~ After George Blake's conviction, the question of the validity of REGAL intelligence was combined with doubts concerning its intelligence value. American intelligence officials could not ignore the possibility of a massive disinformation campaign mounted by the Soviets. Although they determined that it was highly unlikely that the Soviets and East Germans had the time, funds, and inclination to undertake such an immense effort,¹⁴⁰ speculation continued on possible precautionary measures the Soviets may have taken. Because the evidence presented at Blake's trial was never made public, it is not known when (and/or whether) he actually informed the Soviets about the tunnel. To protect himself, Blake may have delayed presenting the information, realizing that he might be suspected if the Soviets "discovered" the tunnel immediately upon its

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becoming operational. On the other hand, the Soviets themselves may have deliberately postponed exposing REGAL in order to protect Blake.

~~(TS-CCO)~~ The cause of REGAL's exposure has not been, and probably never will be, ascertained. Frank Rowlett believed that the Soviets deliberately exposed the tunnel on 21 April 1956 for their own unknown reasons. At the time, the CIA determined that it was the unpredictable result of bad luck. Perhaps only a few Soviet officials and George Blake ever knew for sure. However, the presence of bad weather, flooded cables, and electrical shorts are indisputable facts. Despite Soviet knowledge of the intercept operation and unanswered questions concerning the validity of the information, it is very probable that REGAL's exposure was the unexpected result of poor weather rather than any deliberate Soviet initiative. To understand possible Soviet motives concerning the tunnel, the two types of monitored communications – telephone and teleprinter wires – must be examined separately.

~~(TSC)~~ Ostensibly, the Berlin tunnel functioned as a telephone wiretap center. The Soviets almost certainly knew this from the beginning; however, it is equally probable that they did not know about the teleprinter operation, as the CIA did not initially inform the British – and George Blake – of its ability to read the teleprinter traffic. As a result, the teleprinter operation yielded relatively high-grade intelligence, while the telephone taps provided low-grade information, important for order of battle and personality files, but containing no policy or military planning data. Perhaps the Soviets cautioned their Berlin garrison about speaking too freely on the telephone. Without exposing their infiltration of British intelligence, the Soviets may have implied that the Berlin wires were tapped.

~~(TSC)~~ The Soviets did not extend this caution and concern to the East German contingent at GSFG. Neither the East German military nor its security police seemed hesitant to discuss highly sensitive information – even counterintelligence – over the telephone. Moscow's distrust and dislike of the East German troops, and its innate need for superiority, overrode basic security concerns.

~~(S)~~ Based on the confused GSFG reaction to the tunnel discovery, the CIA concluded that the East Germans happened upon REGAL by chance. Subsequent revelations about Blake did not provide sufficient evidence to refute this determination. If Blake did disclose REGAL, it seems he'd have no problem providing sufficient information for the Soviets to find the approximate location.

Crescendo and Decline

~~(TSC)~~ About halfway through the NSA REGAL effort, PROD pulled increasingly large numbers of Russian linguists away from REGAL to work on [REDACTED]

[REDACTED] Previously, an NSA team in Berlin had discovered that the Soviets were also experimenting with microwave communications. Although merely speculation, it appears that Soviet communications security efforts focused on developing technologically advanced communications modes for future communications, rather than protecting those currently in use. In this way, they did not risk either compromising Blake by exposing REGAL, or inadvertently tipping off the U.S. by warning all Soviets and East Germans at GSFG not to use the telephone lines. Perhaps the premature discovery of REGAL prevented the CIA, NSA, and GCHQ from expending increased funds and effort on a superseded source of intelligence.

~~(S)~~ The combined U.S.-U.K. effort, when viewed in terms of sheer volume, was a clear success. The three monitored cables "contained 273 metallic pairs capable of

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transmitting a total of approximately 1,200 communication channels," with up to 500 in use at any one time.¹⁴¹ On the average, the monitors recorded 28 telegraphic circuits and 121 voice circuits continuously, resulting in about 50,000 reels of magnetic tape totaling about 25 tons.¹⁴²

~~(S)~~ The personnel who processed REGAL material were spread out among several organizations. MPU in London employed 317 persons who transcribed 20,000 Soviet two-hour voice reels containing 368,000 conversations. MPU processed 5,500 of the 13,500 German voice reels received, fully transcribing 17,000 conversations.¹⁴³ Many of the transcribers remained with the organization after it became the London Processing Group (LPG), working under James Nielson when he served as the first U.S. LPG Deputy Branch Chief.¹⁴⁴

~~(S)~~ In Washington, 350 people at TPU processed 18,000 six-hour Soviet teletype reels and 11,000 six-hour German teletype reels. Some of the reels had as many as 18 separate circuits which used time-division multiplexing to create additional circuits. The CIA stationed a small crew of two to four persons in Berlin for immediate monitoring of crucial intelligence and maintaining security.¹⁴⁵ The number of NSA employees included in the TPU figures has been impossible to ascertain as NSA was not mentioned in the official CIA history of REGAL. The exact number of NSA analysts, supervisors, and clerical workers processing REGAL material is also unknown because the numbers changed monthly due to varying requirements and part-time personnel. GENS-14 kept thorough records of NSA REGAL personnel in the beginning of the operation, but less inclusive documentation as time progressed. As of December 1956 REGAL processing employed about 120 NSA personnel either at AHS or Fort Meade.¹⁴⁶

~~(S)~~ By the time MPU concluded its operations on 30 September 1958, terminating the \$6.7 million U.S.-U.K. REGAL effort, the three agencies had issued 1,750 REGAL reports and 90,000 translations. According to the CIA, the agencies cleared about 1,500 U.S. persons for at least some access to REGAL information between 1955 and 1958. However, the compartmentation was so thorough that many of these were unaware of the information source until the Soviets and East Germans exposed the operation.¹⁴⁷

Legacy

~~(TSC)~~ Operation REGAL involved various intelligence community members - CIA, NSA, Army, and GCHQ - between its planning stage in the early 1950s and the end of REGAL intercept processing in 1958. Vast amounts of information of varying degrees of intelligence interest were intercepted. Numerous engineers, monitors, processors, analysts, managers, and linguists aided the ostentatious and expensive effort. In retrospect, the amount of actual intelligence material recovered from REGAL appears small in relation to the large-scale U.S.-U.K. attack on East German and Soviet communications. While most of the intelligence was probably genuine and not part of a Soviet disinformation campaign, it was not crucial information, nor even unique. As a result - or, perhaps, as a weak justification for an expensive and not overwhelmingly successful undertaking - the CIA asserts that REGAL's most valuable legacy was not the intelligence derived, but the morale boost it gave the U.S. intelligence community at the expense of the Soviet Union and the sense of security inherent in the realization that Europe could not be the subject of a Soviet attack without U.S. foreknowledge.

~~(TS-CCO)~~ NSA's motives for its REGAL participation distinguished it from CIA, and its goals and expectations were correspondingly distinct. NSA did not receive accolades for its part in the operation for several reasons. It was the CIA which ingeniously engineered and constructed the tunnel and equipment, while NSA officially

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included only about a dozen individuals in the actual covert intercept operation. NSA conducted its endeavors predominantly in the 18 months following the intercept shutdown, by which time the tunnel's color and appeal had waned. CIA operatives deserved credit for their glamorous operation, despite REGAL's probable exposure by Blake. NSA did not want public recognition, but wanted instead what the agency believed was more valuable – its acceptance by U.S. intelligence community members as a viable and equal contributor to the intelligence effort. There was a great deal of competition between the CIA and NSA at the time, and NSA, as the less established of the two, felt compelled to prove its worth. REGAL provided an opportunity CIA, unable to process REGAL material adequately, reluctantly recruited NSA assistance, thereby formally recognizing NSA analytic skills. Consequently, in addition to the intelligence it obtained from [REDACTED], NSA benefited immeasurably from its collaboration on the REGAL effort with the CIA and GCHQ because of the contacts made, the official exchanges, and the respect extended by the other collaborators for the NSA effort.

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SECRET**NOTES**

1. (U) Vyrl E. Leichliter and Frank Rowlett. "The Berlin Tunnel Operation: 1952-1956," 24 June 1969, Clandestine Services History, No. 150, CIA. (S)
2. (U) David C. Martin, *Wilderness of Mirrors* (New York: Harper and Row, Publishers, 1980), p. 73. (U)
3. (U) Leichliter and Rowlett, "Tunnel." (S)
4. (U) Martin, *Wilderness*, p. 74. (U)
5. (U) Martin, *Wilderness*, p. 74. (U)
6. (U) Martin, *Wilderness*, p. 74. (U)
7. (U) Martin, *Wilderness*, p. 74. (U)
8. (U) Interview Philip Dibben, 10 May 1985 by Robert D. Farley, OH 09-85, NSA. (TSC SENS/LIMDIS)
9. (U) Martin, *Wilderness*, p. 75. (U)
10. (U) Leichliter and Rowlett, "Tunnel." (S)
11. (U) Leichliter and Rowlett, "Tunnel." (S)
12. (U) Martin, *Wilderness*, p. 76. (U)
13. (U) Martin, *Wilderness*, p. 76. (U)
14. (U) Leichliter and Rowlett, "Tunnel." (S)
15. (U) Leichliter and Rowlett, "Tunnel." (S)
16. (U) Martin, *Wilderness*, p. 78. (U)
17. (U) E. H. Cookridge, *The Many Sides of George Blake Esq.: The Complete Dossier* (Princeton: Brandon/Systems Press, Inc., 1970) p. 158; Martin, p. 100. (U)
18. (U) Leichliter and Rowlett, "Tunnel." (S)
19. (U) Leichliter and Rowlett, "Tunnel." (S)
20. (U) Martin, *Wilderness*, p. 79. (U)
21. (U) Leichliter and Rowlett, "Tunnel." (S)
22. (U) "Wonderful Tunnel," *Time*, (7 May 1956) 67:42. (U)
23. (U) Leichliter and Rowlett, "Tunnel." (S)
24. (U) Martin, *Wilderness*, p. 80. (U)
25. (U) Leichliter and Rowlett, "Tunnel." (S)
26. (U) Martin, *Wilderness*, p. 80. (U)
27. (U) Leichliter and Rowlett, "Tunnel." (S)
28. (U) Leichliter and Rowlett, "Tunnel." (S)
29. (U) Martin, *Wilderness*, p. 82. (U)
30. (U) The U.S. intelligence community obtained order of battle information during the tunnel construction through the close watch kept on the highway: analysts were able to ascertain the relative importance of visitors to East Berlin by the security measures implemented between the airport and the city.
31. (U) Leichliter and Rowlett, "Tunnel." (S)
32. (U) Martin, *Wilderness*, p. 83. (U)
33. (U) Martin, *Wilderness*, p. 83. (U)
34. (U) Leichliter and Rowlett, "Tunnel." (S)
35. (U) Leichliter and Rowlett, "Tunnel." (S)
36. (U) Leichliter and Rowlett, "Tunnel." (S)
37. (U) Interview Colonel Russel Horton, 24 March 1982, 8 April 1982, 23 April 1982 by Robert D. Farley, OH 06-82, NSA. (TSC)
38. (U) Dibben interview, OH 09-85. (TSC SENS/LIMDIS)
39. (U) Interview Dr. James R. Nielson, 21 July 1986 by Robert D. Farley and [] OH 20-86, NSA. (TS-CCO)
40. (U) Horton interview, OH 06-82. (TSC)
41. (U) [] Intercept: Landline Cables in East Berlin," 1 April 1957, Series VI, I.3.5, Historical Collection, NSA. Hereinafter cited as "[] Intercept." (TSC)
42. (U) Martin, *Wilderness*, p. 84. (U)
43. (S-CCO) An NSA analyst stationed at [] at the time recalled that a [] CIA team occupied a back room at the station. Having researched the tunnel, he surmised that, unknown to the NSA staff, the CIA team correlated radio signals with the landline intercept at REGAL. When circuits vanished from the landlines monitored at [] the callsigns were cabled to [] and the CIA team would use the station's rhombic antennas to search for them. When a signal went off the air, the CIA team would have Telegraphic Processing Unit search for it in the printer traffic. The CIA team left [] following the discovery of the tunnel. []
44. (U) Leichliter and Rowlett, "Tunnel." (S)
45. (U) Special intelligence refers to a category of sensitive compartmented information requiring special controls for restricted handling within compartmented intelligence systems and for which compartmentation is established. Compartmentation is a formal system of restricted access to intelligence activities, such systems established by and/or managed under the cognizance of the Director of Central Intelligence to protect the sensitive aspect of sources, methods, and analytical procedures of foreign intelligence programs.
46. (U) Leichliter and Rowlett, "Tunnel." (S)
47. (U) Nielson interview, OH 20-86. (TS-CCO)

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48. (U) Nielson interview, OH 20-86. (TS-CCO)
49. (U) Nielson interview, OH 20-86. (TS-CCO)
50. (U) Nielson interview, OH 20-86. (TS-CCO)
51. (U) Nielson interview, OH 20-86. (TS-CCO)
52. (U) Martin, *Wilderness*, p. 84. (U)
53. (U) [] Intercept." (TSC)
54. (U) Interview Jane E. Dunn, 29 June 1981 by Robert D. Farley, OH 05-81, NSA. (TSC)
55. (U) GENS was one of four major operational divisions of NSA's Production Organization; it combined later with ADVA (Advanced Soviet) into A Group.
56. (U) Nielson interview, OH 20-86. (TS-CCO)
57. (U) Nielson interview, OH 20-86. (TS-CCO)
58. (U) Interview Dr. James R. Nielson, 14 May 1980 by Robert D. Farley and Henry Schorreck, OH 18-80, NSA. (S-CCO)
59. (U) Dunn interview, OH 05-81. (TSC)
60. (U) [] Intercept." (TSC)
61. ~~48~~ Between 1956 and 1958, CIA launched several hundred helium balloons equipped with observation cameras for travel over Eastern Europe and the Soviet Union. Although several balloons produced valuable information, many more fell or were shot down over the Soviet Union, triggering official protests to Washington and alienating President Eisenhower. See Donald E. Welzenbach, "Observation Balloons and Reconnaissance Satellites," *Studies in Intelligence* (Spring 1986) 30:21-28. (S)
62. (U) Washington REGAL Center Intelligence Report, 28 May 1956, Cryptologic Archival Holding Area, NSA. (TSC)
63. (U) Nielson interview, OH 20-86. (TSC)
64. (U) [] Intercept." (TSC)
65. (U) [] Intercept." (TSC)
66. (U) Dibben interview, OH 09-85. (TSC SENS/LIMDIS)
67. (U) Nielson interview, OH 20-86. (TS-CCO)
68. (U) GENS-143 Monthly Operation Summary, July 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
69. (U) GENS-143 Monthly Operation Summary, August 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
70. (U) GENS-143 Monthly Operation Summary, July 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
71. (U) GENS-143 Monthly Operation Summary, December 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
72. (U) GENS-143 Monthly Operation Summary, August 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
73. (U) GENS-14 Monthly Operation Summary, October 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
74. (U) GENS-14 Monthly Operation Summary, October 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
75. (U) GENS-143 Monthly Operation Summary, August 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
76. (U) GENS-14 Monthly Operation Summary, December 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
77. (U) GENS-143 Monthly Operation Summary, September 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TS EIDER US/UK EYES ONLY)
78. (U) Nielson interview, OH 20-86. (TS-CCO)
79. (U) Nielson interview, OH 20-86. (TS-CCO)
80. (U) GENS-14 Monthly Operation Summary, January 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC US/UK EYES ONLY)
81. (U) Nielson interview, OH 20-86. (TS-CCO)
82. (U) GENS-14 Monthly Operation Summary, March 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC US/UK EYES ONLY)
83. (U) GENS-44 Monthly Operational Summary, April 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC US/UK EYES ONLY)
84. (U) [] Intercept." (SC)
85. (U) GENS-44 Monthly Operational Summary, April 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA; GENS-44 Monthly Operational Summary, May 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC US/UK EYES ONLY)
86. (U) [] Intercept." (TSC)
87. (U) GENS-44 Monthly Operational Summary, May 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
88. (U) Index of GCHQ Soviet REGAL Summaries, 1 February 1957. (TSC)
89. (U) Leichter and Rowlett, "Tunnel." (S)
90. (U) GENS-44 Monthly Operational Summary, September 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
91. (U) Nielson interview, OH 20-86. (TS-CCO)

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92. (U) GENS-44 Monthly Operational Summary, November 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
93. (U) GENS-44 Monthly Operational Summary, December 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
94. (U) GENS-44 Monthly Operational Summary, January 1958, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
95. (U) One channel day represented a continuous piece of hard copy containing the traffic transmitted in one direction on one circuit for a 24-hour period.
96. (U) GENS-44 Monthly Operational Summary, December 1957, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
97. (U) GENS-44 Monthly Operational Summary, April 1958, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
98. (U) GENS-44 Monthly Operational Summary, June 1958, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC)
99. (U) Nielson interview, OH 20-86. (TS-CCO)
100. (U) Dibben interview, OH 09-85. (TSC SENS/LIMDIS)
101. (U) Leichliter and Rowlett, "Tunnel," Appendix A: *Discovery by the Soviets of PBJOINTLY*. (S)
102. (U) Leichliter and Rowlett, "Tunnel," Appendix A. (S)
103. (U) Leichliter and Rowlett, "Tunnel," Appendix A. (S)
104. (U) Martin, *Wilderness*, p. 87. (U)
105. (U) "Great Berlin Tunnel Mystery," *Life*, (7 May 1956) 40:48. (U)
106. (U) Walter Sullivan, "Russians Say U.S. Taps Berlin Wire: They Show Tunnel Allegedly Dug from West to Listen in on Eastern Phones," *The New York Times*, (24 April 1956) 1:5. (U)
107. (U) "East Germans File a Wiretap Protest," *The New York Times*, (26 April 1956) 1:5. (U)
108. (U) Sullivan, "Russians." (U)
109. (U) Cookridge, *George Blake*, p. 158. (U)
110. (U) Walter Sullivan, "U.S. Investigates Wiretap Tunnel: Aides in Berlin Say They Are Looking into Soviet Charge of Phone Espionage," *The New York Times*, (25 April 1956) 8:3. (U)
111. ~~According~~ According to an NSA engineer stationed in Berlin at the time, the CIA put British labels on U.S. voltage meters. See Interview Charles L. Gandy, 17 July 1986 by Robert D. Farley and Thomas Johnson, OH 19-86, NSA. (TS)
112. (U) Sullivan, "Russians." (U)
113. (U) Martin, *Wilderness*, p. 87. (U)
114. (U) "Reds Play Up Berlin Tunnel," *The New York Times*, (29 April 1956) 29:3. (U)
115. (U) "Reds Blame Dulles' Sister," *The New York Times*, (11 May 1956) 2:6. (U)
116. (U) Martin, *Wilderness*, p. 87. (U)
117. (U) Leichliter and Rowlett, "Tunnel." (S)
118. (U) Interview Frank B. Rowlett, 14 May 1985, by Robert D. Farley, Henry Schorreck, and Gerald K. Haines, OH 10-85, NSA. (S-CCO)
119. (U) Cookridge, *George Blake*. (U)
120. (U) Seth S. King, "Briton Sentenced as Spy for Soviet," *The New York Times*, (4 May 1961) 1:8. (U)
121. (U) "Ex-British Aide Held on Security Charge," *The New York Times*, (19 April 1961) 16:6. (U)
122. (U) "Briton Accused as Spy," *The New York Times*, (25 April 1961) 3:6. (U)
123. (U) Martin, *Wilderness*, p. 100. George Blake served time in Wormwood Scrubs Prison. Although originally placed on the escape list and allocated a special security cell, the "model prisoner" was removed from this list in October 1961. He escaped from prison on 22 October 1966 with the help of fellow prisoner Sean Alphonsus Bourke of the Irish Republican Army. They arrived in Moscow several weeks later, where Blake was awarded the Order of Lenin. For more information see Sean Bourke, *The Springing of George Blake* (New York: The Viking Press, Inc., 1970), and E. H. Cookridge, *The Many Sides of George Blake Esq.* (Princeton: Brandon/Systems Press, Inc., 1970). (U)
124. (U) "Spy Had No U.S. Data," *The New York Times*, (6 May 1961) 22:6. (U)
125. (U) Rowlett interview, OH 10-85. (S-CCO)
126. (U) Martin, *Wilderness*, p. 100. According to Sean Bourke, Blake boasted that "the KGB knew about the tunnel before the first spadeful of earth was dug out of the ground. I saw to that." See Bourke, *The Springing of George Blake*, p. 275. This account has not been substantiated. (U)
127. (U) Martin, *Wilderness*, p. 101. (U)
128. ~~(TS)~~ The Soviets may have decided to accelerate their development of microwave relay communications. According to Charles L. Gandy, an NSA engineer stationed in Berlin during the tunnel's operational period, REGAL traffic decreased dramatically part way through the year, generating a requirement to discover a reason. NSA [redacted] discovered a growing Soviet microwave system. See Gandy interview, OH 19-86. (TS)
129. (U) Of perhaps minor significance to the compromise of the tunnel was the presence of Kim Philby who defected in 1963, confirming his involvement in spy activities first suspected in 1951 with the defections of Donald Maclean and Guy Burgess. Philby had been the MI-6 representative in Washington in 1949, serving as a liaison between the U.S. and U.K. intelligence organizations. Although he remained in British intelligence until 1963, he was under sufficient suspicion to limit his access to certain sensitive materials. Although it is quite probable that he had some knowledge of the existence of [redacted] via official or unofficial channels, he did not mention the Berlin tunnel in the autobiography he later published from Moscow. (U)

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- 130. (U) Dikken interview, OH 09-85. (TSC SENS/LIMDIS)
- 131. (U) Allen Dulles, *The Craft of Intelligence* (New York: Harper and Row, Publishers, 1963), pp. 206-7. (U)
- 132. (U) Nielson interview, OH 20-86. (TS-CCO)
- 133. (U) Martin, *Wilderness*, p. 88. (U)
- 134. (U) Nielson interview, OH 20-86. (TS-CCO)
- 135. (U) "[redacted] Intercept." (TSC)
- 136. (U) Leichliter and Rowlett, "Tunnel," Appendix B: *Recapitulation of the Intelligence Derived*. (S)
- 137. (U) Leichliter and Rowlett, "Tunnel," Appendix B: *Recapitulation of the Intelligence Derived*. (S)
- 138. (U) The CIA later obtained additional information concerning Zhukov's fall from power from Oleg Penkovskiy, a Soviet defector who had served as a high-ranking member of Soviet military intelligence. See Oleg Penkovskiy, *The Penkovskiy Papers*, trans. Peter Deriabin, with an introduction by Frank Gibney (New York: Ballantine Books, 1982). (U)
- 139. (U) Leichliter and Rowlett, "Tunnel," Appendix B: *Recapitulation*. (S)
- 140. (U) The Soviets possibly diverted strategic intelligence [redacted]
- 141. (U) Leichliter and Rowlett, "Tunnel." (S)
- 142. (U) Leichliter and Rowlett, "Tunnel." (S)
- 143. (U) Leichliter and Rowlett, "Tunnel." (S)
- 144. (U) Nielson interview, OH 20-86. (TS-CCO)
- 145. (U) Leichliter and Rowlett, "Tunnel." (S)
- 146. (U) GENS-143 Monthly Operational Summary, December 1956, Accession Number 10243, Cryptologic Archival Holding Area, NSA. (TSC US/UK EYES ONLY)
- 147. (U) Leichliter and Rowlett, "Tunnel." (S)

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